

**Claims**

What is claimed is:

- 1           1.     An optical margin testing system for an automatic power  
2 control loop comprising:  
3           an optical circuit including a laser diode and a monitor diode coupled  
4 to said automatic power control loop;  
5           a bias generator circuit for generating a control signal; said control  
6 signal applied to said automatic power control loop; and  
7           said control signal enabling an operation point of said laser diode to  
8 both increase and decrease by a set percentage value.
- 1           2.     An optical margin testing system for an automatic power  
2 control loop as recited in claim 1 wherein said bias generator circuit for  
3 generating said control signal includes a tri-state receiver.
- 1           3.     An optical margin testing system for an automatic power  
2 control loop as recited in claim 2 wherein said tri-state receiver receives an  
3 input signal; said input signal is applied to said tri-state receiver for selecting  
4 one of a normal operational mode, an increased set percentage value  
5 operational mode, and a decreased set percentage value operational mode.
- 1           4.     An optical margin testing system for an automatic power  
2 control loop as recited in claim 3 wherein said bias generator circuit for  
3 generating said control signal includes a current mirror coupled to said tri-  
4 state receiver.
- 1           5.     An optical margin testing system for an automatic power  
2 control loop as recited in claim 4 wherein said current mirror provides said  
3 control signal applied to said automatic power control loop.
- 1           6.     An optical margin testing system for an automatic power  
2 control loop as recited in claim 1 wherein said automatic power control loop  
3 applies a bias current to said laser diode responsive to said control signal.

1           7.     An optical margin testing system for an automatic power  
2 control loop as recited in claim 1 wherein said monitor diode coupled to said  
3 automatic power control loop provides a feedback current to said automatic  
4 power control loop.

1           8.     An optical margin testing system for an automatic power  
2 control loop as recited in claim 4 wherein said bias generator circuit for  
3 generating said control signal includes an input current generating circuit  
4 coupled to said current mirror.

1           9.     An optical margin testing system for an automatic power  
2 control loop as recited in claim 8 wherein said input current generating circuit  
3 includes a variable resistor having a value represented by  $R_{APC}$ ; said  
4 variable resistor reflecting a voltage reference value  $V_{REF}$  for generating an  
5 input current applied to said current mirror.

1           10.    An optical margin testing system for an automatic power  
2 control loop as recited in claim 9 wherein said input current applied to said  
3 current mirror is substantially equal to  $V_{REF} / R_{APC}$ .

1           11.    An optical margin testing system for an automatic power  
2 control loop as recited in claim 9 wherein said input current generating circuit  
3 includes an operational amplifier coupled to said variable resistor and  
4 wherein said voltage reference value  $V_{REF}$  is applied to said operational  
5 amplifier.

- 1           12. An optical margin testing system for an automatic power  
2 control loop comprising:  
3           an optical circuit including a laser diode and a monitor diode coupled  
4 to said automatic power control loop;  
5           a tri-state receiver;  
6           a current mirror coupled to said tri-state receiver for generating a  
7 control signal; said control signal applied to said automatic power control  
8 loop; said control signal enabling an operation point of said laser diode to  
9 both increase and decrease by a set percentage value; and  
10          an input signal being applied to said tri-state receiver for selecting one  
11 of a normal operational mode, an increased set percentage value  
12 operational mode, and a decreased set percentage value operational mode;
- 1           13. An optical margin testing system for an automatic power  
2 control loop as recited in claim 12 wherein said automatic power control loop  
3 applies a bias current to said laser diode responsive to said control signal.
- 1           14. An optical margin testing system for an automatic power  
2 control loop as recited in claim 12 wherein said monitor diode coupled to  
3 said automatic power control loop provides a feedback current to said  
4 automatic power control loop responsive to said control signal.
- 1           15. An optical margin testing system for an automatic power  
2 control loop as recited in claim 12 includes an input current generating circuit  
3 coupled to said current mirror.
- 1           16. An optical margin testing system for an automatic power  
2 control loop as recited in claim 15 wherein said input current generating  
3 circuit coupled to said current mirror includes a variable resistor having a  
4 value represented by  $R_{APC}$ ; said variable resistor reflecting a voltage  
5 reference value  $V_{REF}$  for generating an input current applied to said current  
6 mirror.
- 1           17. An optical margin testing system for an automatic power  
2 control loop as recited in claim 16 wherein said input current applied to said  
3 current mirror is substantially equal to  $V_{REF} / R_{APC}$ .

- 1           18.    An optical margin testing system for an automatic power  
2    control loop as recited in claim 16 wherein said input current generating  
3    circuit includes an operational amplifier coupled to said variable resistor and  
4    wherein said voltage reference value  $V_{REF}$  is applied to said operational  
5    amplifier.

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